

1. Barry and Kath are studying a number pattern.

The first three numbers in the number pattern are 1, 2, 4

Barry says that the next number is 8.

Kath says the next number is 7.

Explain why both Barry and Kath could be right.

.....
.....
.....

(Total 2 marks)

2. Here are the first five terms of a number sequence.

3 8 13 18 23

(a) Write down the next **two** terms of the sequence.

.....,

(2)

(b) Explain how you found your answer.

.....

(1)

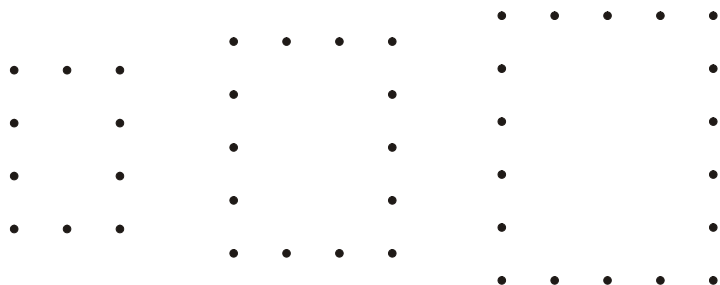
(c) Explain why 387 is **not** a term of the sequence.

.....
.....

(1)

(Total 4 marks)

3. Here are some patterns made up of dots.



Pattern number 1 Pattern number 2 Pattern number 3

(a) In the space below, draw Pattern number 4.

(1)

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of dots	10	14	18		

(1)

(c) How many dots are used in Pattern number 10?

.....

(1)
(Total 3 marks)

4. Here are the first five terms of a number sequence.

126 122 118 114 110

(a) Write down the next two terms of the number sequence.

..... , (1)

(b) Explain how you found your answer.

..... (1)

The 20th term of the number sequence is 50

(c) Write down the 21st term of the number sequence.

..... (1)
(Total 3 marks)

5. (a) The first odd number is 1.

(i) Find the 3rd odd number.

.....

(ii) Find the 12th odd number.

.....

(2)

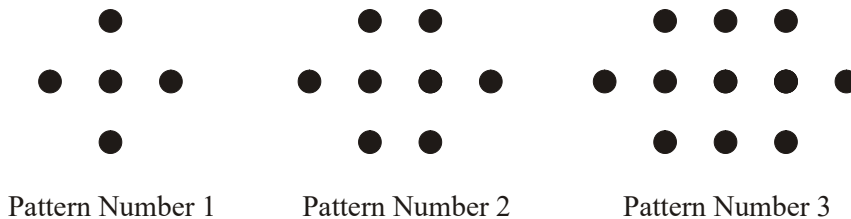
(b) Write down a method you could use to find the 100th odd number.

.....

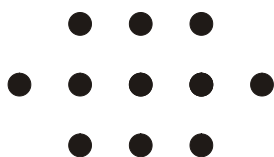
.....

(1)

Here are some patterns made with dots.



(c) In the space below, complete Pattern Number 4.



(1)

The table shows the number of dots used to make each pattern.

(d) Complete the table

Pattern Number	1	2	3	4	5
Number of dots	5	8	11		

(2)
(Total 6 marks)

6. Here are the first 5 terms of a number pattern.

3 7 11 15 19

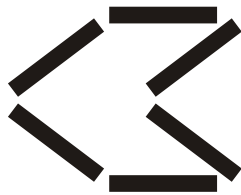
(a) Write down the next term in the number pattern.

(1)

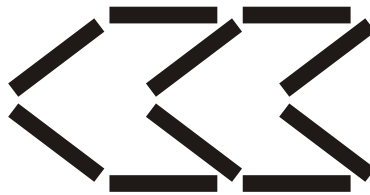
(b) Work out the 8th term in the number pattern.

(1)
(Total 2 marks)

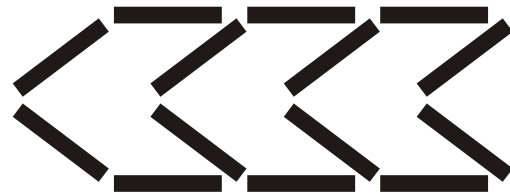
7. Here are some patterns made from sticks.



Pattern number 1



Pattern number 2



Pattern number 3

(a) Complete Pattern number 4.

(1)

(b) Complete the table.

Pattern number	Number of sticks
1	6
2	10
3	14
4	
5	

(2)
(Total 3 marks)

8. Here are the first four terms of a number sequence.

2 7 12 17

(a) Write down the next two terms of this number sequence.

..... ,

(2)

(b) Work out the 10th term of this number sequence.

.....

(2)

(Total 4 marks)

9. Adam makes some patterns using sticks.

Pattern Number 1



5 sticks

Pattern Number 2



9 sticks

Pattern Number 3



13 sticks

(a) Draw Pattern Number 4 in the space above.

(1)

(b) Complete the table.

Pattern Number	1	2	3	4	5
Number of sticks	5	9	13		

(1)

(Total 2 marks)

10. Here are the first five terms of a number sequence.

1 5 10 16 23

Write down the next **two** terms of the sequence.

.....

(Total 2 marks)

11. Here are the first four numbers of a simple sequence.

5 8 11 14

- (a) Write down the next two numbers of the sequence.

..... (2)

- (b) Write down, in words, the rule to continue this sequence.

..... (1)
(Total 3 marks)

12. Here are the first four numbers of a simple sequence.

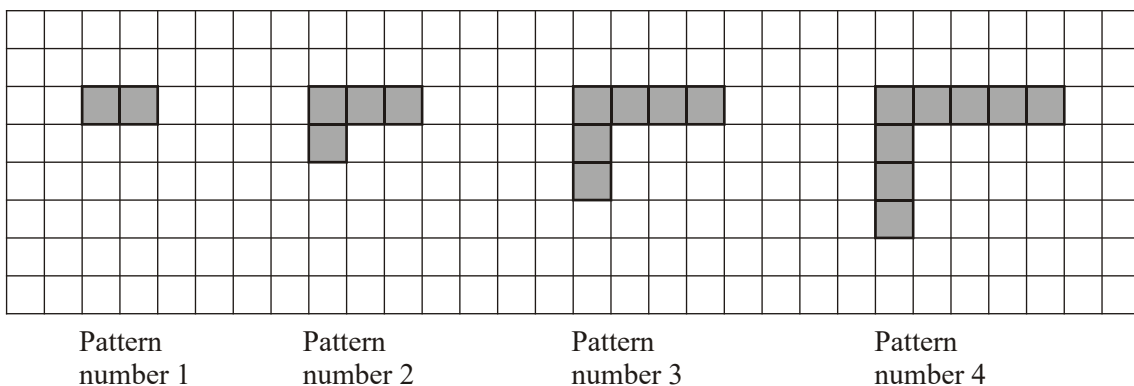
6 10 14 18

Write down the next two numbers in the sequence.

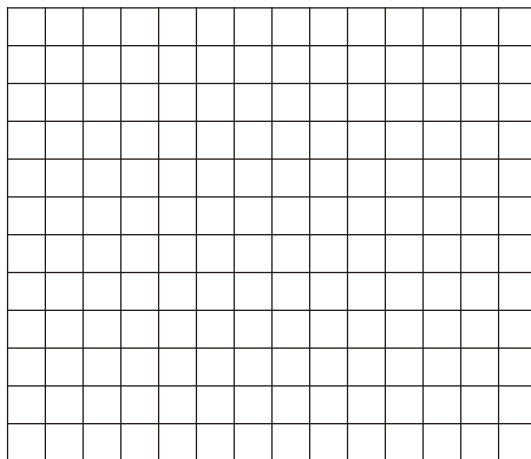
.....

(Total 2 marks)

13. Here are some patterns made out of squares.



(a) On the grid draw Pattern number 5.



(1)

(b) Complete the table for Pattern number 5 and Pattern number 6.

Pattern number	1	2	3	4	5	6
Number of squares	2	4	6	8		

(1)
(Total 2 marks)

14. Here are the first four terms of a simple sequence.
Write down the next term in the sequence.

5 12 19 26

.....
(Total 1 mark)

15. Here are the first 4 terms of a simple number sequence.

6 11 16 21

- (i) Write down the next term of the sequence.

.....

- (ii) Explain how you found your answer.

.....
(Total 2 marks)

16. (a) Here are the first four terms of a number sequence.

3 7 11 15

Write down the next two terms of the sequence.

.....,

(1)

- (b) Explain how you found your answer.

.....
(1)
(Total 2 marks)

17. Here are the first five terms of a number sequence.

10 16 22 28 34

(a) Which one of these numbers is a square number?

..... (1)

(b) Write down the next term of the number sequence.

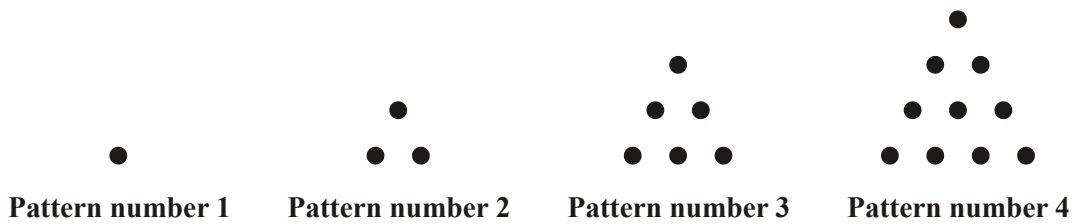
..... (1)

(c) Explain why 861 is **not** a term of the number sequence.

.....

(1)
 (Total 3 marks)

18. Here are some patterns made with dots.



(a) In the space below, draw Pattern number 5

(1)

(b) How many dots are used in Pattern number 6?

.....
 (1)
 (Total 2 marks)

19. Here are the first 5 terms of a number pattern.

3 7 11 15 19

(a) Write down the next term in the number pattern.

.....
 (1)

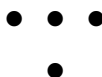
(b) Work out the 8th term in the number pattern.

.....
 (1)
 (Total 2 marks)

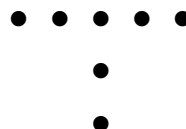
20. Here are some patterns made up of dots.



Pattern number 1



Pattern number 2



Pattern number 3

(a) In the space below, draw Pattern number 4

(1)

(b) Complete the table for Pattern number 4 and Pattern number 5

Pattern number	1	2	3	4	5
Number of dots	1	4	7		

(1)
(Total 2 marks)

21. Here are some patterns made from crosses.

××

Pattern number 1

×××
×××

Pattern number 2

××××
××××
××××

Pattern number 3

(a) In the space below draw Pattern number 4

(1)

(b) Complete the table.

Pattern number	Number of crosses
1	$1 \times 2 = 2$
2	$2 \times 3 = 6$
3	$3 \times 4 = 12$
4

(1)

(c) Work out the number of crosses in Pattern number 10

.....

(1)

(Total 3 marks)

22. Here are the first five terms of a simple sequence.

4 7 10 13 16

(a) Write down the next two terms of the sequence.

..... , (2)

(b) Explain how you found your answer.

..... (1)
(Total 3 marks)

23. Here is a sequence of numbers.

5 9 13 17

Find the next number in the sequence.

18 19 20 21 22
 A **B** **C** **D** **E**

(Total 1 mark)

24. Here are the first five terms in a sequence of numbers.

7 10 13 16 19

What is the 10th term in this sequence?

25 30 31 34 37
 A **B** **C** **D** **E**

(Total 1 mark)

25. Here is a sequence of numbers.

5 10 8 13 11

Work out the next number in this sequence.

$\frac{9}{\text{A}}$ $\frac{11}{\text{B}}$ $\frac{15}{\text{C}}$ $\frac{16}{\text{D}}$ $\frac{18}{\text{E}}$

(Total 1 mark)

1. 2
 Barry (8) because you double
 Kath (7) because you add, 1,2,3
Bl oe
Bl oe
SC: Bl for correct rules only

[2]

2. (a) 28, 33 2
Bl, Bl
(Bl ft for "28" + 5 if both numbers >25)

(b) 1
Bl for add 5, +5, for going up in 5's the difference is 5 oe

(c) 1
Bl for they end in 3 and 8, it ends in 7;
or refers to 383 and 388 are in sequence

[4]

3. (a) Diagram 1
Bl cao

(b) 22, 26 1
Bl cao

(c) 46 1
Bl cao

[3]

4. (a) 106, 102 1
B1 cao ignore extras
- (b) eg take away 4 1
B1 could be indicated on the diagram
- (c) 46 1
B1 cao
- [3]**
5. (a) (i) 5 2
B1 cao
- (ii) 23
B1 cao
- (b) $\times 2 - 1$ 1
B1 for explaining a suitable method
- (c) See their diagram 1
B1 for a correct diagram
- (d) 14, 17 2
B2 cao for both (B1 for one only ft from their 14)
- [6]**
6. (a) 23 1
B1 cao
- (b) 31 1
B1 cao
- [2]**
7. (a) Picture of 4 arrowheads made from 18 matchsticks 1
B1 for any reasonable diagram

	(b)	18 22		2	
			<i>B1 for 18</i> <i>B1 for 22 (ft + 4 on their 18)</i>		[3]
8.	(a)	22, 27	<i>B2 (B1 ft for +5 on "22")</i>	2	
	(b)	Continue sequence by +5 47	<i>M1 for carrying on sequence by adding 5</i> <i>A1 for 47</i> <i>SC B2 for "27" + 20</i>	2	
					[4]
9.	(a)	Pattern 4	<i>B1</i>	1	
	(b)	17, 21	<i>B1 for both</i>	1	
					[2]
10.		31, 40	<i>B2 cao (B1 for 31 or 40)</i>	2	
					[2]
11.	(a)	17, 20	<i>B1 for 17</i> <i>B1 f.t. for "17" + 3</i>	2	
	(b)	Add 3	<i>B1</i>	1	
					[3]

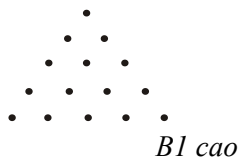
12. 22, 26 2
Bl for 22
Bl for 26 or "22" + 4 provided both numbers ≥ 20 **[2]**
13. (a) Diagram 1
 6 squares to right and 5 down
Bl
- (b) 10 12 1
Bl **[2]**
14. 33 1
Bl **[1]**
15. (i) 26 2
Bl
- (ii) add 5 **[2]**
Bl for recognising a difference of 5
16. (a) 19, 23 2
Bl for both
- (b) Add 4 **[2]**
Bl for valid rule
17. (a) 16 1
Bl
- (b) 40 1
Bl (accept 40, 46)

(c) explanation
Bl for valid explanation e.g all even numbers

1

[3]

18. (a)



1

(b) 21
Bl cao

1

[2]

19. (a) 23
Bl cao

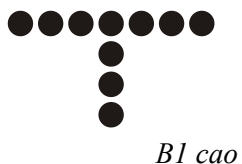
1

(b) 31
Bl cao

1

[2]

20. (a)



1

(b) 10, 13
Bl cao

1

[2]

21. (a) 4 rows by 5 cols 1
Bl for 4 rows by 5 columns of crosses

(b)

(4)	$4 \times 5 = 20$
-----	-------------------

 1
Bl for $4 \times 5 = 20$ accept 20 on its own

(c) 110 1
Bl cao

[3]

22. (a) 19, 22 2
Bl for 19
Bl ft for 22 (" 19 " + 3)

(b) Add 3 oe 1
Bl for 'add 3' or "goes up in 3's" oe
(the explanation must mention the common difference of 3)
Acceptable answers include:
"goes up in 3's"
"add 3"
" +3"
"you miss 3 every time"
"goes in 3's"
Recognising that the difference is 3 between more than just 2
consecutive terms.
Eg "it's 3 from 4 to 7 to 10 to 13"
"because it jumps 3 spaces"
Showing the differences of 3 on the diagram is sufficient if the
formal explanation isn't.
"there is a pattern where you add 3"
Sight of $3n + 1$
Sight of $n + 3$ is a clear indication that 3 is being added to a
term to get the next term.

Unacceptable answers include:

“the pattern is 3”

“I counted up to 7 and how many I counted up to that’s how you get the next number in the sequence”

“because $7 - 4$ is 3”

“I add my fingers till I get to the next number”

“I found the differences between each one then added it to the final answers to find the next one”

“count from the 4 to the 7 and found out it was 3 in between”

“I looked at the difference between each number”

“each time you add the number 4”

“by looking at what you add to get the next number”

“I looked at the sequence and found the n th term”

“The sequence rule is times by 3”

[3]

23. D

[1]

24. D

[1]

25. D

[1]

1. Mathematics A Paper 2

Over half of the candidates found this question difficult. Candidates were more successful in explaining Barry’s pattern than Kath’s pattern. Common wrong answers for Kath’s pattern was that the numbers add up to 7. Some candidates understood the method, but found the ability to explain it very difficult.

Mathematics B Paper 15

Candidates provided a variety of ways, often incorrect, of continuing the sequence. Stating the connection between the numbers in the sequence was the more successful of the statements on offer. The idea of ‘doubling’ for Barry was recognised by many but there were also attempts to incorrectly describe this in terms of ‘ $1 \times 1 = 1$, $2 \times 2 = 4$, $4 \times 4 = 8$ ’. The sequence for Kath appeared more of a challenge with ‘ $1 + 2 + 4 = 7$ ’ being a common incorrect answer. At the same time there were many who recognised the pattern went ‘+1, +2, +3’, but when they tried to put this into words, they struggled to express themselves clearly. ‘Up by 3 and up by 4’ was also popular as was a reference to ‘evens’ and ‘odds’.

2.
 - (a) 96% of candidates answered this part of the question successfully.
 - (b) 80% of candidates were able to communicate what they did to find the next terms of the sequence, although some did not give sufficient detail. For example, some simply stated that they “found the difference” without quantifying the difference.
 - (c) One third of candidates gave a valid explanation though some candidates confused the sequence with ‘multiples of 5’ and others gave answers depending on knowing information about other terms in the series (e.g. 382).

3. Intended as a straightforward start to the paper, the pattern in the first part proved more demanding than expected and drawing errors were quite common. The other two parts were much better answered, although, in the final part, 52, obtained by doubling the number of dots in Pattern number 5, appeared regularly.

4. This standard question on number sequences was well answered. Some candidates continued the sequence to the left (130, 134) using the rule “add 4”, which received no credit. Others wrote down the next two terms correctly but gave the rule as “take away 2”. Only a brief explanation, such as “Take away 4” or “The difference is 4” was required for part (b). Some candidates gave unnecessarily lengthy accounts of their methods.

5. In part (a) the first mark was obtained by 62% of candidates whilst only 36% of candidates could write down the 12th odd number. In part (b) credit was given here to any candidate who described a correct method for generating odd numbers which would eventually enable them to find the 100th odd number. Many candidates suggested a method of the sort equivalent to finding the 10th odd number then multiplying by 10, which of course is incorrect, whilst others linked odd numbers to multiples of 3. Only 26% obtained the mark in part (b). Candidates were far more successful with part (c) with nearly 80% gaining the mark and part (c) was even more successful with 88% gaining both marks.

6. This proved to be a successfully answered question with over 80% of the candidates getting both parts correct. 22 or 24 were the most common incorrect responses to (a) which then lead to an incorrect response in (b).

7. The pattern of sticks question was well answered, with 86% of candidates able to give a correct response. This increased to 90% when the number pattern had to be completed.

8. Most candidates scored full marks on this question. Working being shown was particularly important here as some failed to count correctly to find the 10th term. Some counted the 10th term starting from 22, or 27, whilst some went too far or not far enough. This gained a method mark if working was shown.
9. The majority of candidates scored full marks for (a). Part (b) was almost always correct even when the candidate could not draw the correct diagram in part (a).
10. This question was very well done by all levels of ability, with most candidates obtaining both correct solutions.
11. The vast majority of the candidates scored the full 3 marks for this question.
12. Most candidates scored the full two marks on this question. It was unusual to see an incorrect response.
13. 85% of the candidates were able to correctly draw Pattern number 5 but a few experienced difficulties with the common shaded square and this led to seven squares being incorrectly indicated in the horizontal stack. Nearly all candidates correctly completed the table in (b).
14. Writing down the next term in the sequence was done very well with the vast majority of the candidates realising that the difference was 7 and adding this on to 26 produced 33. Many went on to add 7 again producing answers of 33, 40 but were not penalised for doing this.
15. 93% of candidates were able to recognise that the next term in the sequence was '26'. The reason why was also often clearly stated (81% of candidates) with the idea of 'adding 5' included in their response. Candidates who did not indicate that 5 was added to the previous term did not score the second mark. Many candidates stated that they added 4 or added 6 to get their answer, even though they wrote 26 in part (i).

16. This question proved to be a good starter question with over three quarters of the candidates scoring both marks. The most common error in part (a) was to write 19, 24 even though they then went on to give the rule as add 4 in some form. In part (b) there were generally three different types of incorrect reasons. The first was putting their reasons in too general terms such as “I counted between the numbers...” with no mention of adding 4. The second was the too specific type where the reason given was “ $7 - 3 = 4$ ” with no generalisation or progression up the sequence. The third was “add 3” confusing the amount of numbers that were missed out before the next number in the sequence with what was being added.
17. Recognition of a square number from a given list of numbers seemed to be quite challenging with the ‘22’ being the most quoted incorrect answer. Less than half the candidates were able to provide the correct answer of 16. Around 85% were able to correctly identify the next term in the number sequence. Part (c) required an explanation as to why ‘861’ was not a term in the sequence and the notion of an ‘odd’ or ‘even’ number would have sufficed. 40% of the candidates were able to provide a valid explanation. Stating that it ‘was too big a number’ or ‘not in the six times table’ were not rewarded.
18. 80% of the candidates were able to access the first mark on the paper. The most common error was to miss out the top dot or to approach the problem by only drawing the dots at the sides, omitting the middle 3 dots. Candidates were less successful in part (b) with only two thirds of the candidates realising that Pattern number 6 had 21 dots. The most frequent mistake was to see that Pattern number 5 had five more dots than Pattern number 4 and therefore they added this number of dots to get 20 for Pattern number 6.
19. This question was answered well with 93% of candidates correctly giving the next term in the number pattern. In part (b) at least 80% of candidates could give the eighth term correctly, but a significant number gave 35 as the answer. They had presumably obtained this by either miscounting the number of terms or by adding 4 onto the first term eight times. Little evidence of how candidates worked out their answer was seen.
20. Candidates were about 90% successful in this question as they were able to draw the next pattern in the sequence and state the number of dots in the next two pattern numbers.

21. Over 80% of the candidates were able to complete Pattern number 4 correctly. In part (b) completing the table from the developing pattern was handled correctly in the vast majority of cases. The most common error was to write $4 \times 4 = 16$. Finding the number of crosses used in Pattern number ten provided a variety of approaches with a continuation of the table being the most popular and drawing in the tenth one also in evidence. The most common errors in part (b) was to write $9 \times 10 = 90$. As well as this, $10 \times 11 = 111$ came up quite frequently.
22. (a) All but a few candidates recognised the pattern in the sequence were able to correctly quote the correct two terms. The incorrect answers, 19, 21 or 20, 23 were sometimes seen but each of these was able to score one mark.
- (b) Most candidates gained the mark in this part of the question, correctly explaining the need to add 3 in order to compute subsequent terms of the sequence.
23. No Report available for this question.
24. No Report available for this question.
25. No Report available for this question.